

## Claims

1. A method for detecting atrial arrhythmia for an individual patient, the method comprising the steps of:
  - receiving at least one electrical signal indicative of a heart's activity;
  - 5       - based on the at least one electrical signal, generating a plurality of short-term HRV data sets, one short-term HRV data set indicating the heart's rate variability within a time period of a given length and two consecutive short-term HRV data sets having a given time difference;
  - performing a frequency analysis of at least some of the short-term HRV data sets generated;
  - 10       - based on a frequency analysis performed, defining a power level that corresponds to at least one selected frequency component in the corresponding short-term HRV data set, wherein a power level is defined for at least some of the short-term HRV data sets; and
  - 15       - based on the power levels defined, estimating an occurrence of the heart's atrial arrhythmia episodes.
2. A method according to claim 1, wherein the estimating step includes determining onset and ending moments of the heart's atrial arrhythmia episodes.
3. A method according to claim 1, wherein the performing step includes performing a frequency analysis of all short-term HRV data sets generated and the defining step includes defining a power level for all short-term HRV data sets generated.
4. A method according to claim 1, wherein the performing step includes performing a Fourier transformation on at least some of the short-term HRV data sets.
5. A method according to claim 1, wherein the given length is between 2 and 5 minutes.

6. A method according to claim 5, wherein the given time difference is substantially shorter than said time period.

7. A method according to claim 6, wherein the given time difference is between 10 and 30 seconds.

8. A method according to claim 6, wherein the given time difference remains constant for all short-term HRV data sets generated.

9. A method according to claim 6, further comprising a step of giving the time difference a new value in the middle of the generating step.

10. A method according to claim 9, further comprising a step of replacing some of the short-term HRV data sets generated by generating new short-term HRV data sets beginning from a selected time moment, wherein the time difference between two consecutive new short-term HRV data sets has said new value.

11. A method according to claim 1, wherein the at least one selected frequency component is above 0.3 Hz.

12. A method according to claim 11, wherein the at least one selected frequency component forms at least one frequency band.

13. A method according to claim 1, wherein the least one selected frequency component is below 0.3 Hz.

14. A method according to claim 1, wherein the first plurality of short-term HRV data sets covers a desired monitoring period.

15. A method according to claim 14, wherein the desired monitoring period is 24 hours.

**16.** A system for detecting atrial arrhythmia for an individual patient, the system comprising:

- measurement means for obtaining data indicative of a heart's activity;
- first processing means for generating a first plurality of short-term HRV data sets from the data, one short-term HRV data set indicating the heart's rate variability within a time period of a given length;
- frequency analysis means for performing a frequency analysis of at least some of the short-term HRV data sets, the frequency analysis means being configured to define a power level corresponding to at least one selected frequency component in an individual short-term HRV data set for obtaining a second plurality of power levels; and
- calculation means, responsive to the frequency analysis means, for estimating, based on the second plurality of power levels, an occurrence of the heart's atrial arrhythmia episodes.

**17.** A system according to claim **16**, wherein the calculation means are configured to determine onset and ending moments of the heart's atrial arrhythmia episodes.

**18.** A system according to claim **16**, wherein the frequency analysis means are configured to define a power level corresponding to a selected frequency band in an individual short-term HRV data set.

**19.** A system according to claim **16**, further comprising means for displaying the atrial arrhythmia episodes and their durations in time domain.